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# **COBRA 2006**

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# Review of Impact of Post-Tsunami Reconstruction and Rehabilitation on Infrastructure Facilities

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On 26 December 2004, an earthquake in the West Coast of Northern Sumatra set off a series of other earthquakes lasting for several hours which resulted in a Tsunami in the Indian Ocean. This led to widespread disaster, particularly in Sri Lanka, India, the Maldives, Indonesia and Thailand, with damage also in Malaysia, Bangladesh, Somalia, the Seychelles and Kenya. Sri Lanka, the 'pearl of the Indian Ocean', blessed with abundant natural resources, faced one of the worst natural disasters recorded in recent history. The Tsunami struck a relatively thin but long coastal area stretching over 1,000 kilometers - two thirds of the country's coastline. The destructive ocean waves killed more than 35,000 people, displaced nearly 2,500,000 people and destroyed thousands of houses. The overall damage to Sri Lanka is estimated at \$1 billion, with a large proportion of losses concentrated in housing, tourism, fisheries and transportation. Development Partners range from private individuals both inside and outside Sri Lanka, to governments and NGOs. Coastal infrastructure, namely roads, railways, power, telecommunications, water supply and fishing ports were also significantly affected. Reactions ranged from immediate assistance to communities and local governments in restarting to function as speedily as possible, to short and long-term assistance in supporting communities to rebuild their infrastructure and housing so that they might again have normal lives and eventually recover from the trauma of the tsunami.

As the infrastructure consists primarily of transportation, electric and telecommunications, and water and sewerage facilities that provide services to the public through a network of roads, rails, ports, airports, pipes and lines, the effectiveness of infrastructure systems impact on all economic activities. In this context, this paper aims to analyse the impact of the Tsunami on infrastructure facilities in Sri Lanka and how the post-Tsunami reconstruction process has affected the development of the same. A comprehensive literature review was carried out regarding the Tsunami and its impact on the nation. The infrastructure-related reconstruction and rehabilitation data were obtained from the RADA (Reconstruction And Development Agency, formerly TAFREN) through unstructured interviews conducted among personnel involved in the reconstruction and rehabilitation of infrastructure facilities. Results confirm that after almost one and a half years, the Tsunami rehabilitation process is slow as compared to its start.

**Keywords:** Tsunami, infrastructure, reconstruction, disaster management.

## **INDIAN OCEAN TSUNAMI – 2004**

### **OVERVIEW**

Sri Lanka, the 'pearl of the Indian Ocean', blessed with abundant natural resources, faced one of the worst natural disasters recorded in recent history. An under-sea quake, measured at 8.9 on the Richter Scale by the Hawaii Seismic Centre, occurred near Sumatra in the early hours of 26 December 2004 and set off a series of waves which devastated parts of India, Bangladesh, Indonesia, Thailand, Malaysia, Sri Lanka, the Maldives, Somalia, the Seychelles, Kenya in the East African Coast. Sri Lanka was one of the countries which suffered the heaviest losses.

The percentage of the coastal population affected ranges from about 20% in the southern districts of Galle, Matara and Hambantota, to 80% in the north and east districts of Ampara, Batticaloa, Mullativu and Trincomalee. The overall damage is estimated at \$1 billion, with major losses concentrated in the housing, tourism, fisheries and transport sectors (ADB, 2006). Total losses across all sectors are estimated to be about 5% of the GDP of Sri Lanka (ADB, 2006). The largest share of output losses appear to be in the fisheries and tourism sectors due to lost income and production. Many people working in the informal sector who serviced the fisheries, tourism sectors and the coastal communities have lost their homes and livelihoods, causing greater vulnerability to poverty.

### **OVERALL DAMAGES**

The Tsunami has led to an unprecedented loss of life, also causing severe damage to private and commercial property as well as the productive assets and livelihoods of people in 13 districts. These losses include:

- 35,322 people were killed, more than 516,150 people were displaced and over two thirds of the island's coastline and outlying 13 districts were affected. Over 6000 are reported missing (United Nations, 2005).
- An estimated 98,000 houses were damaged or destroyed, leaving approximately 940,000 people with no homes to return to (United Nations, 2005).
- 65% of the room capacity in the hotel sector has been affected, with all the sea-side resorts damaged.
- The road and rail transport from Colombo to Hambantota in the south and some parts of the Puttalam district were badly damaged. Railway lines required major repairs. Approximately 800km of national roads, together with about 1500km of provincial and local government roads were damaged by the force of the Tsunami, along with 25 bridges and causeways located in the north, east and south of the country.
- The Tsunami had a devastating effect on the coastal fisheries industry, leaving 16,919 fishing boats lost or destroyed and a further 7,266 damaged. An estimated 1 million fishing nets were also lost. Many of the landing sites around the coast were also seriously damaged. 90% of the fishing crafts were reported to have been damaged, with 100% of the modern sea-going fleet completely destroyed.
- 10 out of the 12 fisheries harbors were damaged, while 8 were completely destroyed.

## IMPACT OF THE TSUNAMI ON INFRASTRUCTURE FACILITIES

The Tsunami further damaged coastal infrastructure that was already in a seriously debilitated condition due to the recent conflict, maintenance neglect, lack of development investment and the effects of high rainfall and flooding in recent years. Specific impacts on the coastal infrastructure included:

- **Roads:** erosion damage occurred on sections of the coastal highway network and a number of bridges were damaged or completely washed away. A total length of approximately 800km of National Road was damaged, together with about 1500km of provincial and local government roads.
- **Railways:** sections of track-work, bridges, signalling and communications systems, buildings and some rolling stock were severely damaged on the 160km of coastline between Colombo and Matara.
- **Electricity:** the electricity distribution system and service connections suffered damage throughout the Tsunami-affected areas.
- **Water Supply and Sanitation:** potable water treatment and reticulation systems suffered damage, and local supply systems - mainly ground water sourced - suffered damage and salt water intrusion.
- **Ports:** facilities and vessels were damaged at the ports of Galle, Trincomalee, Kankasanthurai and Point Pedro, and the perimeter wall. Some equipment was also damaged at the Oluwil Port Training Centre.

## DISASTER MANAGEMENT

A precise definition of environmental disaster is difficult. Natural disasters are those elements of the physical environment harmful to Man and caused by forces extraneous to him. Natural disasters have also been seen as 'acts of god'. We tend to over-emphasise the surprise factor of a disaster when, in reality, it is now possible to delineate many hazard-prone areas and to recognise that common disasters, such as floods, are recurrent events at certain locations. It is clear that risk assessment and risk perception have to be combined in the attempts made by governments and others to reduce environmental disasters. Effective disaster management requires accurate and timely information, which is utilised for a number of vital tasks.

Disaster management activities can be grouped into five phases that are related by time and function to all types of emergencies and disasters. These phases are also related to each other, and each involves different types of skills.

- **Planning:** activities necessary to analyse and document the possibility of an emergency or disaster and the potential consequences or impacts on life, property and the environment. This includes assessing the hazards, risks, mitigation, preparedness, response and recovery needs.
- **Mitigation:** activities that actually eliminate or reduce the probability of a disaster; for example, an arms build-up to deter enemy attack, or legislation that requires stringent building codes in earthquake prone areas. It also includes long-term activities designed to reduce the effects of unavoidable disasters; for example, land use management, establishing comprehensive emergency management programs and so forth.

- **Preparedness:** activities necessary to the extent that mitigation measures have not, nor cannot prevent disasters. In the preparedness phase, governments, organisations and individuals develop plans to save lives and minimise disaster damage; for example, compiling state resource inventories, mounting training exercises, installing early warning systems and preparing predetermined emergency response forces. Preparedness measures also seek to enhance disaster response operations.
- **Response:** activities following an emergency or disaster. These activities are designed to provide emergency assistance for victims. They also seek to stabilize the situation, reduce the probability of secondary damage and speed up recovery operations.
- **Recovery:** activities necessary to return all systems to normal or better. They include two sets of activities:
  - *Short-term recovery activities* return vital life support systems to minimum operating standards.
  - *Long-term recovery activities* may continue for a number of years after a disaster. Their purpose is to return life to normal or improved levels; for example, redevelopment loans, legal assistance, community planning and the reconstruction of infrastructure facilities.

## **DISASTER MANAGEMENT IN TSUNAMI RECONSTRUCTION**

Immediately after the Tsunami, positive collective actions were taken on a scale never known before. Individuals, small groups, the government, religious institutions, private sector organisations, the media and non-governmental organisations all rushed to reach distraught and desperate fellow citizens. Recognising the seriousness, urgency and magnitude, the government created an institutional mechanism to efficiently co-ordinate assistance. This mechanism built upon donor delivery of assistance and agreed upon guiding principles for the recovery process; these included transparency and accountability, subsidiary, co-ordination and consultation. In the aftermath of tsunami, the President set up three task forces:

1. Task Force for Rescue and Relief (TAFRER)
2. Task Force for Law and Order and Logistics (TAFLOL)
3. Task Force to Rebuild the Nation (TAFREN)

At the national level, the Center for National Operations (CNO) was established under the President to co-ordinate relief operations and to gather and disseminate information. Within two months, the provision of immediate relief was streamlined and the relevant government officers at the national, provincial, local and village levels began to play key roles. The CNO was disbanded in February 2005 when TAFRER and TAFLOL were merged to form TAFOR (Task Force for Relief), with a mandate for looking after the well-being of affected groups.

TAFREN was created as the primary institutional mechanism in recovery and reconstruction. TAFREN's role was to co-ordinate, facilitate and assist implementing organisations in co-ordinating donor assistance and fund-raising activities, expediting the procurement process, and enabling implementing agencies through capacity building. Today the TAFREN function as RADA. In September 2005 TAFREN reorganised itself, focusing on four thematic areas:

- Getting people back into homes.
- Restoring livelihoods.
- Health education and protection for all.
- Upgrade national infrastructure.

## **ANALYSIS OF TSUNAMI RECONSTRUCTION AND REHABILITATION OF INFRASTRUCTURE PROJECTS**

Naturally, re-housing the people was first on the government's list of priorities, pushing the rehabilitation and reconstruction of the economic infrastructure to second place and thereby affecting the growth potential of the country further. Therefore after attending to emergency repairs, the government has entered into the phase of rehabilitation and reconstruction of national infrastructure in the affected areas, with the support of many development partners. However, although almost all the required funding has been received, in some cases contracts have been awarded and rehabilitation work is in progress, whereas in others contracts have not been finalized.

The reconstruction phase is likely to take off from the rehabilitation process and may not be the outcome of a set of well-designed and considered plans. If the reconstruction process goes along these lines, Sri Lanka may lose an opportunity to re-build the devastated portions of the country. However, all indications are that badly laid out settlements with sub-standard housing and inadequate infrastructure will spring up once again – this time with government funding rather than foreign aids. Even though immediate rehabilitation has been very successful, the collected information suggests the progress of long-term rehabilitation of infrastructure facilities is slow.

### **ROADS AND BRIDGES**

The affected roads were repaired and made motorable within two weeks of the Tsunami, while sufficient repairs to bridges / the installation of temporary Bailey bridges was implemented to enable the movement of traffic. Long-term development plans for roads and bridges were also introduced and initiated perfectly. The current statuses of the post-Tsunami reconstruction of roads and bridges are shown in Tables 1 and 2.



**Table 1: Rehabilitation and reconstruction status of road network as at 30 April 2006.**

S/NO	Name of Road with Route No.	Rehab. Work Type	District	Length of Road (km)	Tentative cost (Rs. Mn)	Donor	Present Status	START DATE	COMPLETION DATE
1	Rehabilitation of Colombo – Galle – Hambantota – Wellawaya Road (A2) from Katukurunda (Kalutara) to Matara	A	KA/GA/MA	115.09	2400	WB	Quarries & Crushers are in operation in all 3 contracts. Binder course 30 L.Km in Pck I, 3.2 L.km in Pck II and 2.3 L.m in Pck III completed. Clearing drains, culverts are in progress.	Sep-05	Mar-07
2	Rehabilitation of Wellawaya to Monaragala to Siyambalanda to Karaitivu.	C	MO/AM	148.00	2230	WB	Pck 9 tender s were closed on 08-03-2006 and evaluation is in progress. Pck 10 tenders will be closed on 09-05-2006.	Jun-06	Sep-08
3	Rehabilitation of Colombo – Galle – Hambantota – Wellawaya Road (A2) from Matara to Weerawila	B	MA/HA/MO	98.00	2450	EC	CATB approved PQ list for ICB sent for ADB concurrence and response is awaited. Bid documents submitted for ADB concurrence. Tender documents for LCB Southern sector is under review by TEC. RFP documents for consultancy have been issued to 11 preselected firms. The original submission date 27-04-2006 needs extension due to subsequent change of scope of civil works.	Jun-06	Sep-08
4	Panegamuwa Debarawewa		HA	4.10	74				
5	Tissa – Kirinda (B422)		HA	13.00	260				
7	Section necessary for emergency repairs in Tsunami affected Region-STAART		GA/MA/HA/AM/BA/TR/ MU/JA	-	1700	JAPAN	Works are in progress on 23 items N.H & 31 items Access roads. Estimates are prepared for other items. Total expenditure as at 31-12-2006 is 78millions.	Jan-05	Dec-06
8	Potuvil to Akkaraipattu	C		45.20	1172	EC	CATB approved PQ list for ICB sent for ADB concurrence and response is awaited. Bid documents submitted for ADB concurrence. RFP documents for consultancy have been issued to 11 preselected firms. The original submission date 27-04-2006 needs extension due to subsequent change of scope of civil works.	Jun-06	Sep-08
9	Akkaraipattu to Batticaloa (A004) to Thirukkondiyamaduru (A15) (junction with A11)	B	AM/BA	98.00	3130	JAPAN	Loan Agreement was signed in March 2006. TEC approved PQ documents, Bid documents and RFP documents were submitted to CATB. Contract Awards are expected by December 2006	Dec-06	Dec-08
10	Construction of roads from Thirukkondiyamaduru to Verugal to Muttur to Trincomalee	C	BA/TR	74.03	1900	AFD	Consultants have mobilized. PQ documents for Civil Works are being reviewed by the consultants. Contract Award is expected by February 2007	Feb-07	Sep-08
11	Rehabilitation of Allai Kantale Road (B10) including Causeways 6m with shoulder.	C	TR	41.00	1050				
12	Construction of roads from Trincomalee to Pulmoddai	C	TR	55.00	825	ADB	CATB approved PQ list for ICB sent for ADB concurrence and response is awaited. Bid documents submitted for ADB concurrence. RFP documents for consultancy have been issued to 11 preselected firms. The original submission date 27-04-2006 needs extension due to subsequent change of scope of civil works.	Jun-06	Sep-08
14	Mullaitivu-Mankulam Road (AA034)	C	MU	49.25	890				
15	Mullaitivu-Puliyankulam Road (B296)		MU	41.83	750				
16	Paranthan- Karachchi-Mullaitivu Road (AA035)		MU/KI	52.13	940				
17	Point-Pedro - Kodikamam (B68)		JA	17.00	310				

**Main Scope of Work**

- A Repair & pave with Asphaltic Concrete (AC), including small structures
- B Rehabilitate and improve to 2-lane, repave with Asphaltic Concrete (AC), including small structures
- C Rehabilitate and improve to 2-lane, repave with Double Bituminous Surface Treatment (DBST), including small structure

(Source: Reconstruction and Development Agency)

**Table 2: Rehabilitation and reconstruction status of bridges as at 30 April 2006.**

Project Name	District	Main Item of Work Proposed	Estimated Cost (Rs. Mn)	Funding Arrangements	Present Status	Start Date	Completion Date
5 major bridges on A2 Kalutara to Matara at Akurala, Seenigama, Magalla, Goyyapana & Weligama.	GA/MA	Reconstruction	650	JAPAN	Bye Passes constructed. Foundations under construction. Overall progress is 54.5%	Aug-05	Dec-06
Arugam Bay Bridge (Including approach roads)	AM	Reconstruction	600	USAID	Consultancy Contract was awarded. Designs will be completed by consultants by Mid May 2006. Civil work Contract Award is expected by August 2006.	Sep-06	Dec-08
Komari bridge and causeway	AM	New Construction	800	JAPAN	Detailed designs completed for Periakallar and Koddakallar causeways. De-tour constructed and opened for traffic. Cofferdams are under construction. Designs still continue on Komari and Panichankerni bridges. Progress is very slow.	Sep-05	Dec-06
Periakallar Causeway							
Koddakallar Causeway							
Panichankerni bridge							
Kallady Bridge	BA	Reconstruction	970	JAPAN	Loan Agreement was signed in March 2006. Designs are being carried out. Contract Award is expected by December 2006.	Dec-06	Dec-08
Ooddaimavadi Bridge	BA	Reconstruction	1100	SPAIN	Funds pledged. Loan Agreement is yet to be signed. Project Committee has submitted the report on Project Plan. Contract Awards are expected by September 2006.	Sep-06	Dec-08
Verugal Bridge	TR	Reconstruction	270	AFD	Consultancy awarded and designs will be carried out by the consultants. Contract Award is expected by September 2006.	Sep-06	Dec-08
Kayankerny bridge			150				
Mutur bridge			300				
Gangei Bridge including access			300				
Upparu Bridge including access			400				
Irakkandi Bridge (new 2 lane bridge to replace 1 lane bridge)	TR	New Construction	1190	SPAIN	Funds pledged. Loan Agreement is yet to be signed. Project Committee has submitted the report on Project Plan. Contract Awards are expected by September 2006.	Sep-06	Dec-08
Koduwakattumalai Bridge (currently a ferry)							
Yan Oya Bridge (currently a ferry)							
Bridge to replace Kinya Ferry (existing project)	TR	New Construction	1260	SAUDI	Contract awarded in November 2005. Contractor has mobilised and commenced works.	Nov-05	Feb-08
Mahanama Bridge at Matara Town	MA	Reconstruction	700	KOICA	Designs were completed and work will start by May 2006. Consultants have mobilized	May-06	May-09

(Source: Reconstruction and Development Agency)

**AM** - Ampara      **BA** - Batticaloa      **GA** - Galle      **HA** - Hambantota  
**JA** - Jaffna      **KA** - Kalutara      **KI** - Kilinochchi      **MA** - Matara  
**MO** - Monaragala      **MU** - Mullativu      **TR** - Trincomalee

## FISHERIES

The fisheries industry was one of the sectors hit hardest by the Tsunami. In addition to the loss of lives and homes, fishermen also had the additional burden of watching their livelihoods disappear as the gigantic waves tossed their fishing equipment onto rooftops and trees. However, with assistance from the government and local and international donors, the industry is taking tentative steps to return to pre-Tsunami conditions. New nets have also been issued to the fishermen by the government and NGOs to enable them to recommence fishing (RADA, 2006).

## ELECTRICITY

The government has planned a three stage approach to rebuilding the power supply. The first phase - costing US\$ 25 million - will focus on the installation of electrical distribution systems along the coastal belt. Work on this phase has already begun. At present, 47 substations are once more in operation. Approximately 170km of voltage lines have also been repaired, enabling the restoration of power to 8,580 families. The second stage - costing a further US\$ 42 million - envisages further rehabilitation of the damaged electrical distribution system. Donor nations have already pledged funds for this phase. A third stage - costing US\$ 48 million - will provide for the provision of additional transmission and generation of power along the coastal areas (RADA, 2006).

## WATER SUPPLY

All the water supply systems in coastal area which were affected by the Tsunami were fully or partly damaged. The current progress of rehabilitation work regarding the water supply is shown in Table 3.

**Table 3: District summary resettlement site water supply status progress.**

District	Housing Schemes / Units			Intermediate Water Supply Solution		Permanenat Water Supply Solution				
	No of Housing Schemes with Donor Commitment	No of Housing Schemes Under Implementation	Total No of Units	No of Housing Schemes with Water Supply	% of Housing Schemes Covered with Water Supply	No of Housing Schemes with Water Supply Method Identified	No of Housing Schemes Water Supply System Implementation is in Progress		% of Housing Schemes, Water Supply System Implementation is in Progress	
							Design Stage	Construction Stage	Design Stage	Construction Stage
Kalutara	90	85	5958	39	43%	41	35	4	39%	4%
Galle	66	39	4401	32	48%	39	3	36	5%	55%
Matara	59	37	4319	15	25%	59	48	8	81%	14%
Hambantota	26	20	5269	19	73%	22	6	20	23%	77%
Ampara	34	13	5941	19	56%	32	10	0	29%	0%
Batticaloa	34	6	3915	34	100%	28	15	0	44%	0%
Trincomallee	84	24	5964	36	43%	84	84	0	100%	0%
Mullativu	36	3	5895	36	100%	36	36	0	100%	0%
Killinochi	2	1	500	2	100%	2	0	0	0%	0%
Jaffna	51	23	4810	51	100%	51	29	0	57%	0%
Gampaha	10	2	833	3	30%	3	3	0	30%	0%
Colombo	18	6	1842	0	0%	7	5	0	28%	0%

(Source: Reconstruction and Development Agency)

## SANITATION

Sanitation was also badly affected by the Tsunami. The immediate rehabilitation needs were fulfilled perfectly, but the long-term sanitary projects are still in progress.

## CAUSES FOR DELAYS IN RECONSTRUCTION OF INFRASTRUCTURE FACILITIES

This section briefly identifies the causes for delays in post tsunami re- construction of infrastructure facilities in Sri Lanka.

### Equity

In Sri Lanka, equity issues have attracted a lot of attention. The government has made an effort to ensure equal access to support for all Tsunami-affected people. Whereas entitlements and allocation are the same, the pace of progress is still slower in the north-east, given capacity gaps, lower levels of economic activity and security constraints and concerns in the un-cleared LTTE areas. (Liberation Tigers of Tamil Eelam is a politico-military separatist organisation that has been waging an at times violent campaign for a separate state comprising the Tamil-majority North and East regions of Sri Lanka). Particular attention has also been paid to equity regarding

conflict-affected areas. For example, nearly 5,000 houses have been constructed in 2005, and another 15,000 are planned to be constructed in 2006 with similar standards to Tsunami-affected houses. However, more efforts and resources will be necessary to address the needs of conflict-affected people and international resources for this issue remain limited.

### **Communication barriers**

Communication between the stakeholders in rehabilitation is also a main factor affecting the reconstruction program. In particular, the lack of communication between LTTE and the Sri Lankan Government has had an immense impact on the people in the north east. Even though the housing in the north east area is almost completely reconstructed, the other infrastructure facilities are still in the procurement stages.

### **Difficulties in establishing legal ownership of affected properties due to lack of documentation**

The legal ownership of damaged properties still poses a big problem to the reconstruction of the affected areas, as almost all the documentation was destroyed by the tidal waves.

### **The poor capacity of existing organisations in:**

- Disaster preparedness.
- Handling present tasks.
- Capacity building with existing human resources.
- Incorporating the best practices in environmental sustainability.
- Disaster management.

### **Lack of land**

Soon after the Tsunami, the government declared a 100/200 metre strip of land as a 'no build zone' along the coastal belt of Sri Lanka. Consequently, the reconstruction and redevelopment phases of the Tsunami devastated areas were lagging behind for want of land beyond the so-called buffer zone, especially in Colombo, Kalutara and Gampaha districts. But later, due to appeals from the public and various other parties, the government decided to revise the 100/200 metre buffer zone with immediate effect to a range of between 55-25 metres in the Southern Districts and 100-50 metres in the North East, in order to accommodate special projects and those involved in fisheries related activities.

### **Donors stepping back from investing**

Some of the donors agreed to invest in Sri Lanka if the peace remains. However, in accordance with the current situation, some of the donors have stepped back from their position and this has resulted in several of the government reconstruction projects being abandoned.

### **Victims of the Tsunami**

The major obstacle to a speedy and efficient reconstruction process is the fact that the Tsunami killed many members of the public service and the armed services, whilst also destroying the physical infrastructure which housed the service-delivery points of the Government of Sri Lanka.

### **Standard of the construction industry**

The national construction industry does not have the required number of contractors, equipment, skilled workforce, modern management practices or access to finance

needed to maintain the required speed of the post-Tsunami reconstruction work. In addition, the cost of construction material is increasing.

### **Procurement delay**

The government's procurement methods are very lengthy and tedious, which makes the reconstruction process very slow.

## **CONCLUSION**

A natural disaster will almost certainly strike again in the near future; the problem is that nobody knows exactly when. Logically, it can be expected that – at least in principle – precautions and remedies will be planned and systemic decisions be made concerning what to do 'next time'. However in reality, up-front planning is often totally absent or, at best, insufficient, and post-disaster decisions are improvised in a rush and in difficult circumstances.

After the Tsunami hit Sri Lanka, the Sri Lankan government, recognising the seriousness, urgency and magnitude of the problem coupled with the lack of experience, created an institutional mechanism to efficiently co-ordinate assistance. However, the government's rehabilitation projects are running slowly due to several causes. Currently the disaster management team faces two main challenges in reconstructing the affected area. The first is the unfamiliarity of the event; since there was no awareness of proper disaster management systems, there were lots of errors in past rehabilitation programs. Solving past errors is the main challenge to the disaster management team. The second is the current status of the peace process. A breakdown of the ceasefire agreement between the Government of Sri Lanka and the LTTE has slowed down the reconstruction process and may threaten the security of aid workers. These are the main reasons for the delays in the reconstruction of infrastructure facilities, and now, after almost one and a half years, the post-Tsunami rehabilitation process is very slow as compared to its start.

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## **OTHER USEFUL WEBSITES**

[www.recoverlanka.net](http://www.recoverlanka.net)

[www.tafren.gov.lk](http://www.tafren.gov.lk)